

AF/3673JFW

PATENT APPLICATION

Applicants : Tadashi FUKUMOTO et al
Title : BREAKWATER GENERATING STRUCTURE
Serial No. : 09/863 749 Group: 3673
Confirmation No.: 9164
Filed : May 23, 2001 Examiner: Saldano
Atty. Docket No.: Ishii Case 16

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450



FIRST CLASS MAILING CERTIFICATE

Sir:

I hereby certify that this correspondence is being deposited with the United States Postal Service under 37 CFR 1.8 as first class mail in an envelope addressed to: Commissioner for Patents P.O. Box 1450, Alexandria, VA 22313-1450, on September 17, 2004.


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Correspondence: Letter Transmitting Appeal Brief Fee
dated September 17, 2004
including enclosures listed thereon

190.05/03



PATENT APPLICATION

IN THE U.S. PATENT AND TRADEMARK OFFICE

September 17, 2004

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LETTER TRANSMITTING APPEAL BRIEF FEE

Sir:

Enclosed is Appellants' check in the sum of \$330.00 representing payment of the Appeal Brief fee. The Commissioner is hereby authorized to charge any additional fee which may be required by this paper, or to credit any overpayment, to Deposit Account No. 06-1382. A duplicate copy of this sheet is enclosed.

Respectfully submitted,

IN DUPLICATE


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Encl: Appellants' Brief on Appeal dated September 17, 2004

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APPELLANTS' BRIEF ON APPEAL

Sir:

This is an appeal from the Office Action dated May 18, 2004 finally rejecting Claims 13, 15, 16, 18, 21, 23 and 24.

REAL PARTY IN INTEREST

Nishimatsu Construction Co., Ltd. is the assignee of the present application and the real party in interest.

RELATED APPEALS AND INTERFERENCES

There are no known related appeals and interferences to the present application.

STATUS OF CLAIMS

Claims 6, 7, 12-18 and 21-26 are pending in the present application. Claims 1-5, 8-11, 19 and 20 have been canceled. Claims 6, 7, 12, 22, 25 and 26 have been allowed. Claims 13, 15, 16, 18, 21, 23 and 24 have been rejected. Claims 14 and 17 have been objected to.

STATUS OF AMENDMENTS

An Amendment After Final Rejection addressing "claim objections" accompanies the filing of this Appeal Brief.

SUMMARY OF INVENTION

Appellants' invention, as defined by Claim 13, is directed to submerged breakwater generating structure comprising an open box having a vertical wall for producing a breakwater at an offshore side. The vertical wall has at least one opening at a lower end thereof and the breakwater generating structure also comprises slits inclined with respect to the direction along which waves propagate disposed at the top portion of the box. The slits define openings provided in a spaced-apart relationship between the vertical wall and a second vertical wall of the open box (page 7 of the clean copy of the substitute specification, lines 17-29 and Figure 2).

Claim 15 limits Claim 13 in requiring that at least one hole be formed at the bottom of the box (Figure 2).

Appellants' invention, as defined in independent Claim 16, is directed to a submerged breakwater generating structure comprising an open box having a vertical wall for producing a breakwater at an offshore side, the vertical wall having at least one opening at a lower end thereof. The breakwater generating structure has slits inclined with respect to the direction along which waves propagate disposed at the top portion of the box. The slits define openings provided in a spaced-apart relationship between the vertical wall and a second vertical wall of the open box and the box is formed as two stages and placed on a mound (specification page 8, lines 30-33, specification page 9, lines 1-3 and Figure 4).

Claim 18 limits Claim 16 in requiring that a through-path be provided from said box to a coastal side of the breakwater generating structure (specification page 13, lines 10-16).

Claim 21 limits Claim 13 in requiring that the height of a coastal side wall of the box is higher than a height of the vertical wall and positions of the slits are arranged to become higher toward the coast (specification page 11, lines 12-16).

Appellants' invention, as defined in independent Claim 23, is directed to a method of attenuating waves with a submerged breakwater generating structure in which the improvement comprises bringing the waves into contact with a submerged breakwater generating structure comprising an open box having a vertical wall for producing a breakwater at an offshore side. The vertical wall has at least one opening at a lower end and slits inclined with respect to the direction along which waves propagate disposed at the top portion of the box. The slits define openings provided in a spaced-apart relationship between the vertical wall and a second vertical wall of the open box (specification page 7, lines 17-29 and Figure 2).

Appellants' invention, as defined by independent Claim 24, is directed to a method of attenuating waves with a submerged breakwater generating structure in which the improvement comprises bringing the waves into contact with a submerged breakwater generating structure comprising an open box having a vertical wall for producing a breakwater at an offshore side. The vertical wall has at least one opening at a lower end thereof and slits inclined with respect to the direction along which waves propagate are disposed at the top portion of the box. The slits define openings provided in a spaced-apart relationship between the vertical wall and a second vertical wall of the open box and the box is formed as two stages and placed on a mound (specification page 8, lines 30-33, specification page 9, lines 1-3 and Figure 4).

ISSUES

The first issue presented for review is whether Claims 13, 15 and 21 are unpatentable under 35 USC 102(b) in view of JP 55-110520. The second issue presented for review is whether Claims 16, 18, 23 and 24 are unpatentable under 35 USC 103(a) over JP 55-110520.

GROUPING OF CLAIMS

The claims on appeal do not all stand or fall together. Claims 13, 16, 18, 21, 23 and 24 and Claim 15 are all directed to separately patentable groups of invention.

ARGUMENT

The presently claimed invention is directed to a submerged breakwater generating structure comprising an open box having a vertical wall for producing a breakwater at an offshore side. The vertical wall has at least one opening at a lower end thereof and slits inclined with respect to the direction along which waves propagate are disposed at the top portion of the box. The slits define openings provided in a spaced-apart relationship between the vertical wall and a second vertical wall of the open box. The box can be formed as two stages and placed on a mound.

The present invention is also directed to a method of attenuating waves with a submerged breakwater generating structure in which the improvement comprises bringing the waves into contact with a submerged breakwater generating structure comprising an open box having a vertical wall for producing a breakwater at an offshore side, the vertical wall having at least one opening at a lower end and slits inclined with respect to the direction along which waves propagate disposed at the top portion of the box. The slits define openings provided in a spaced-apart relationship between the vertical wall and a second vertical wall of the open box.

In its broadest form, the present invention is directed to a submerged breakwater generating structure comprising an open box having a vertical wall for producing a breakwater at an offshore side, the vertical wall having at least one opening at a lower end and inclined slits with respect to the direction along which waves propagate are disposed at the top portion of the box. The slits define openings provided in a spaced-apart relationship between the vertical wall and a second vertical wall of the open box.

As discussed previously, the submerged breakwater generating structure of the present invention is smaller than conventional breakwater generating structures, can be constructed at a lower cost and higher efficiency and yet still possesses a high breakwater efficiency. In the claimed invention, wave energy is reduced by the submerged structure through the production of a breaking wave which is introduced into slanted grids and returned offshore from an opening. The breaking waves are caused by a sudden change of the depth of the seawater.

In the claimed invention, the submerged breakwater generating structure has a plurality of slits inclined with respect to the direction along which waves propagate disposed at a top portion thereof and a vertical wall having at least one opening at a lower end thereof which produces a breakwater at an offshore side, with the slits defining openings provided in a spaced-apart relationship between the vertical wall and a second vertical wall of the open box. The breakwater generating structure can be provided in two stages and placed on a mound. It is respectfully submitted that the prior art cited by the Examiner does not disclose the presently claimed invention.

JP '520 discloses a breakwater unit 2 which is placed on a sea bed side by side. A part of the breakwater unit 2 is erected above the seawater surface and comprises a box 1 having sloped side walls 4 at each side of the box 1 and openings 3 at its front and rear end to form passages 3 for allowing the seawater to pass back and forth from the offshore side to the shore side. Concrete plates 5 having a hole 5a are placed on the side walls 4 to form a sloped surface 6 and slits 7. The lower end of the unit is directed to the offshore side. The wave reaches the sloped surface 6 and travels up and dissipates its power by the slits and projections on the surface. The seawater passes through the passages 3 and flows into the shore area.

CLAIMS 13, 16, 18, 21, 23 AND 24
ARE PATENTABLE OVER JP 55-110520

The presently claimed invention is distinguishable over JP 55-110520 in that the breakwater unit disclosed in this reference is not submerged and this reference does not disclose a vertical wall for producing a breakwater at an offshore side which has at least one opening at a lower end thereof. The openings 3 are provided in the front wall of the breakwater unit 2 of JP '520 and are disposed practically throughout the whole height thereof. Therefore, this reference does not disclose a vertical wall disposed at an offshore side which has an opening provided at a lower end thereof. Additionally, the present claims require that the slits be inclined with respect to the direction along which waves propagate. In contrast thereto, the slits in JP '520 are sloped with respect to a vertical direction and not a horizontal direction along which waves propagate. In JP '520, an incoming wave contacts the sloped surface 6 to cause the wave to travel up the surface and be dissipated through passing through the slits 7 and coming to the resistance provided by the projections on the sloped surface. The difference in construction between the presently claimed submerged breakwater generating structure and the breakwater unit of JP '520 is due to the present invention being designed to operate in a submerged state while the breakwater unit of JP '520 is designed to have a part of the sloped surface disposed above the seawater surface. As such, the presently claimed invention is clearly patentably distinguishable over this reference.

CLAIM 15 IS SEPARATELY PATENTABLE OVER JP 55-110520

Claim 15 is separately patentable in that it requires at least one hole be formed at the bottom of the box. JP '520 knows no such structure or equivalent structure. As such, Claim 15 is clearly separately patentable over JP '520.

CONCLUSION

For the reasons advanced above, it is respectfully submitted that the currently claimed invention is clearly patentable over the prior art cited by the Examiner. Reversal of the Examiner's rejection of the claims is respectfully solicited.

Respectfully submitted,

IN TRIPLICATE


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Sidney B. Williams, Jr.	Reg. No. 24 949

Encl: Appendix
Amendment After Final Rejection
Postal Card

110.0703

APPENDIX

16. A submerged breakwater generating structure comprising an open box having a vertical wall for producing a breakwater at an offshore side, said vertical wall having at least one opening at a lower end thereof and slits inclined with respect to the direction along which waves propagate disposed at the top portion of said box, said slits defining openings provided in a spaced-apart relationship between said vertical wall and a second vertical wall of said open box, said box being formed as two stages and placed on a mound.

13. A submerged breakwater generating structure comprising an open box having a vertical wall for producing a breakwater at an offshore side, said vertical wall having at least one opening at a lower end and slits inclined with respect to the direction along which waves propagate disposed at the top portion of said box, said slits defining openings provided in a spaced-apart relationship between said vertical wall and a second vertical wall of said open box.

15. The submerged breakwater generating structure according to Claim 13, wherein at least one hole is formed at the bottom of said box.

18. The submerged breakwater generating structure according to Claim 16, wherein a through path is provided from said box to a coastal side of said breakwater generating structure.

21. The submerged breakwater generating structure according to Claim 13, wherein a height of a coastal side wall of said box is higher than a height of said vertical wall and

positions of said slits are arranged to become higher toward said coast.

23. In a method of attenuating waves with a submerged breakwater generating structure, the improvement comprising bringing the waves into contact with a submerged breakwater generating structure comprising an open box having a vertical wall for producing a breakwater at an offshore side, said vertical wall having at least one opening at a lower end and slits inclined with respect to the direction along which waves propagate disposed at the top portion of the box, said slits defining openings provided in a spaced-apart relationship between said vertical wall and a second vertical wall of said open box.

24. In a method of attenuating waves with a submerged breakwater generating structure, the improvement comprising bringing the waves into contact with a submerged breakwater generating structure comprising an open box having a vertical wall for producing a breakwater at an offshore side, said vertical wall having at least one opening at a lower end thereof and slits inclined with respect to the direction along which waves propagate disposed at the top portion of said box, said slits defining openings provided in a spaced-apart relationship between said vertical wall and a second vertical wall of said open box, said box being formed as two stages and placed on a mound.